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Applicant(s): Kustov, et al.

Docket No.

08CL7174A-16

Application No.
09/682,010Filing Date
July 9, 2001Examiner
JohnsonGroup Art Unit
1725Invention: PREPARATION OF CATALYSTS USEFUL IN THE PREPARATION OF PHENOL AND ITS
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Docket No.
08CL7174-16

In Re Application Of: Kustov, et al.

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/682,010	July 9, 2001	Johnson	43248	1725	1039

Invention: PREPARATION OF CATALYSTS USEFUL IN THE PREPARATION OF PHENOL AND ITS DERIVATIVES

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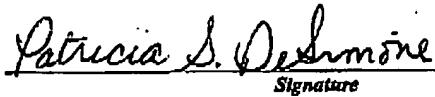
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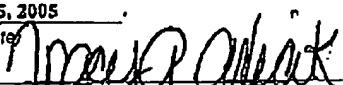
Patricia S. DeSimone
Registration No. 48,137
Customer No. 43248
Phone No. 860-286-2929

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants: Kustov, et al.)
Serial No.: 09/682,010) Group Art Unit: 1725
Filed: July 9, 2001)
For: Preparation of Catalysts Useful in the)
Preparation of Phenol and)
Its Derivatives) Examiner: Johnson

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APPEAL BRIEF

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I. REAL PARTY IN INTEREST

The real party in interest in this appeal is General Electric.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to Appellants, Appellants' legal representatives, or assignee that will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF THE CLAIMS

Claims 1-16 are pending in the application; Claims 6-13 are currently withdrawn from consideration. Claims 1-5 and 14-16 stand finally rejected. Claims 1-16, as they currently stand, are set forth in Appendix A. Appellants hereby appeal the final rejection of Claims 1-5 and 14-16.

IV. STATUS OF THE AMENDMENTS

No amendments to the claims have been filed subsequent to the final rejection dated November 19, 2004. All prior amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claims 1-5 and 14-16 are directed to a process for preparing a zeolite catalyst. The catalyst is used for preparing hydroxylated phenols by the oxidation of aromatic compounds with nitrous oxide. (Paragraphs 10 and 11) It is a well acknowledged fact that catalytic chemistry can be notoriously unpredictable. Thus even apparently small differences in the conversion, selectivity or yield of the catalyzed reaction can have significant value and point to an important and unexpected improvement in the art. Similarly, deactivation of the catalyst over time is a significant and unpredictable factor.

The claimed process comprises three steps. The first step comprises heating a zeolite at a first temperature of 350-450°C in a first flowing gas for 4-6 hours. The second step comprises calcining the zeolite at a second temperature of 450-1000 for 1-3 hours in a second flowing gas wherein the second temperature is at least 100°C greater than the first temperature. The third step comprises cooling the zeolite catalyst to a temperature of 225-500°C.

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Oxidation reactions employing the catalyst calcined as claimed showed significant improvements over oxidation reactions employing catalysts calcined at a single temperature. (Tables 1 and 2)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-5 and 14-16 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 5,576,256 to Monque et al. (Monque).

VII. ARGUMENT

Claims 1-5 and 14-16 are Non-Obvious over Monque.

Claim 1, 2, and 14-16

Monque discloses a catalyst system comprising a catalytically active matrix, a support system distributed through the matrix and a catalytically active phase. (Claim 1) The catalytically active matrix includes aluminum and supports the catalytically active phase that includes a group IIIA metal, a group VIII metal, a group VIB metal and a group VA metal. The support system or medium is a hydrothermally stable porous crystalline silicious molecular sieve material such as a zeolite catalyst. The catalyst system is made by impregnating the zeolite with gallium and/or chromium, drying the impregnated zeolite, mixing the impregnated zeolite with alumina gel to form a catalyst element and impregnating the catalyst element with an aqueous solution of salts of the group VIII, VIB, and VA metals. The impregnated catalyst element is then calcined. Calcining may be carried out at 600°C for 6 hours under a flow of air containing water vapor equivalent to about 0.5 kilograms of water/hour-kilogram of catalyst or in a two stage process, first at a temperature of 120-350°C and then at a temperature of 350-700°C. (Col. 5, lines 10-17)

While Appellants agree that Monque teaches a two stage calcination process, Appellants respectfully point out that two step calcination process of Monque is significantly different from the instantly claimed process in at least two ways. Firstly, the initial stage of Monque is carried out at a temperature range that is significantly lower (120-350°C) than is instantly claimed (350-450°C) although the two ranges do overlap at the extremity of their ranges. Secondly, Monque does not teach or suggest the requirement that the second stage temperature is at least 100°C greater than the first stage temperature as is instantly claimed. Thirdly, Monque does not teach or

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suggest that the two step calcination process is carried out in the presence of a flowing gas, as is instantly claimed.

The teaching of Monque, with the temperature for initial calcination stage at its upper extremity and careful selection of temperature for the second stage, permit a calcination process that is within the instantly claimed process. However, Monque provides no guidance to make these selections. Indeed, calcination could be carried out at a single temperature according to Monque, even in a two stage process. Further, since Monque provides no suggestion or motivation to make these particular temperature selections; one would only know to make these selections with our knowledge of the solution. Monque does not teach or suggest that calcination conditions have any effect whatsoever on the success of the reaction that the catalyst is employed in. Monque teaches a general preference for a two stage calcination but in the examples Monque does not even describe the calcination conditions for the catalysts employed (see, for example, Col. 6, lines 66-67, Col. 11, lines 65-67, Col. 12, lines 8-10 and lines 59-61).

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Appellants respectfully assert that Monque does not provide adequate basis for a rejection under 35 U.S.C. § 103 (a). Monque does not teach or suggest a two stage calcination process wherein calcination is performed in the presence of a flowing gas. Furthermore, Appellants respectfully assert that Monque does not teach that the temperature of the second stage of calcination has to be at least a 100 degree higher than the first calcination temperature as is instantly claimed. Monque also implies that calcination conditions have little or no effect on the conversion/selectivity/yield of a reaction employing the calcined catalyst and thus Monque provides no motivation to make the claimed selection of calcination temperatures. Furthermore, because Monque discloses no relationship between conversion/selectivity/yield and calcination

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there can be no reasonable expectation of success for having a second calcination temperature that is at least 100 degrees higher than the first calcination temperature.

Appellants further maintain that the Examiner has used an improper standard in arriving at the rejection of the above claims under section 103, based on improper hind sight which fails to consider the totality of applicant's invention and to the totality of the cited reference. More specifically the Examiner has used Appellant's disclosure to select portions of the cited references to allegedly arrive at Appellant's invention. In doing so, the Examiner has failed to consider the teachings of the reference or Appellant's invention as a whole in contravention of section 103.

Claims 3-5

Claims 3-5 are directed to a high silica pentasil zeolite, specifically a high silica pentasil zeolite having a Si/Al ratio greater than 20, or even more specifically, having a Si/Al ratio from 40 to 100. In contrast, Monque teaches a Si/Al of 0.01 to 1.0 at Col. 3, lines 63-64 and in Table 1 Monque teaches a Si/Al of 1.3. Appellants respectfully assert that a Si/Al ratio of 1.3 cannot reasonably be considered to be high silica. Accordingly, Appellants believe that Claims 3-5 are non-obvious in view of Monque.

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VIII. CONCLUSION

In summary, Claims 1-5 and 14-16 are non-obvious over the art of record. For the reasons cited above, Appellants respectfully submit that all of the claims are allowable and the application is in condition for allowance. Appellants respectfully request reversal of the outstanding rejections and allowance of this application.

In the event the Examiner has any queries regarding the submitted arguments, the undersigned respectfully requests the courtesy of a telephone conference to discuss any matters in need of attention.

If there are any additional charges with respect to this Appeal Brief, please charge them to Deposit Account No. 07-0862.

Respectfully submitted,

CANTOR COLBURN LLP

By Patricia S. DeSimone

Patricia S. DeSimone
Registration No. 48,137

Date: April 15, 2005
CANTOR COLBURN LLP
55 Griffin Road South
Bloomfield, CT 06002
Telephone (860) 286-2929
Facsimile (860) 286-0115

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APPENDIX A
CLAIMS

1. (Original) A process for preparing a zeolite catalyst comprising:

(a) first, heating a zeolite at a first temperature in the range of 350 - 450°C in a first flowing gas for 4-6 h;

(b) second, calcining the zeolite at second temperature in the range of 450 - 1000°C for 1 - 3 hours in a continuous flow of a second gas, wherein said second temperature is at least 100°C greater than said first temperature; and

(c) third, cooling the zeolite catalyst to a temperature of from 225 - 500°C.

2. (Original) A process according to claim 1, wherein the first flowing gas is selected from the group consisting of nitrogen and air, and the second of gas is selected from the group consisting of an inert gas and air.

3. (Original) A process according to claim 1, wherein the zeolite is a high-silica pentasil zeolite.

4. (Original) A process according to claim 3, wherein the high-silica pentasil zeolite is an H-form of ZSM-5 zeolite with a Si/Al ratio greater than 20.

5. (Original) A process according to claim 4, wherein the Si/Al ratio ranges from 40 to 100.

6 - 13 (Withdrawn)

14. (Original) A process according to claim 1, wherein the zeolite comprises a binder.

15. (Original) A process according to claim 14, wherein the content of the binder in the catalyst ranges from 5 to 50 weight percent.

16. (Original) A process according to claim 15, wherein the content of the binder in the catalyst ranges from 20 to 30 weight percent.